

task of excavating very arduous, and the work was frequently interrupted for days at a time through the growing hostility of the natives. Dr. Forsyth Major and his companion, M. Robert, are therefore the more to be congratulated that, under such unfavourable conditions, they have added so much to our knowledge of the extinct fauna of Central Madagascar.

EXPLANATION OF THE PLATES.

PLATE VIII.

Remains of *Centronis majori* (p. 344).

- Fig. 1. Right tibio-tarsus, from front (figured in two halves).
2. Right tibio-tarsus, distal articulation.
3. Right femur, from front.
4. Right metatarsus, from front.
5. Left coracoid, upper end.
6. Left scapula.
7. Right metacarpus, proximal portion.

All the figures are of the natural size, and, with the exception of the metatarsus, are drawn from the type specimens. The dotted outlines are drawn from more perfect bones.

PLATE IX.

- Fig. 1. Skull of *Chenalopex sirabensis* (p. 355).
2. Metacarpus of ditto.
3. Metatarsus of ditto.
4. *Tribonyx roberti* (p. 356). Pelvis, from above.
5. Ditto. Pelvis, from side.
6. ? Ditto. Left tibio-tarsus.
7. ? Ditto. Left femur.
8. *Plotus nanus* (p. 358). Left humerus.

All the figures are of the natural size. In figs. 4 and 5 the dotted outlines are drawn from the opposite side.

XXVII.—*On Changes of Plumage in some of the Typical Weaver-birds.* By A. G. BUTLER, Ph.D.

ABOUT the year 1888 I purchased two pairs of the so-called Red-billed Weaver-bird (*Quelea quelea*) and a male of Russ's Weaver (*Quelea russi*), and turned them out together in one

of my large aviaries, where they have regularly come into plumage year after year, without any change worth recording, until the early summer of 1896, when one of my males of *Q. quelea* appeared in the breeding-plumage of *Q. russi**. I wrote to Mr. Abrahams respecting this unexpected metamorphosis, asking whether he had ever noticed a parallel case, and he replied saying that he would take an early opportunity of talking the matter over with me. He evidently imagined that I must have been mistaken.

It will be seen, on reference to my 'Foreign Finches in Captivity,' that, writing in 1895, I speak of a male of *Q. russi* quarrelling with cocks of *Q. quelea* (*vide* p. 316), and from that time to the present I have added no Weavers to that aviary. There can therefore be no possibility of my having made a mistake.

When the two "species" are compared, it will be seen that the chief difference between them consists in the colouring of the mask on the face, which is black in *Q. quelea* and buffish in *Q. russi*. The two forms come mixed together in the same consignments from Africa, and doubtless are caught together. It would therefore seem that *Q. russi* is a mere partial albinism, due to weakening of the pigment-cells.

In the autumn of 1895 I purchased a number of examples of *Pyromelana* out of colour, some of which, however, were showing the first indications of change of plumage; among them were five males of *P. franciscana* and six of *P. afra*. All these birds continued to develop their nuptial plumage up to the first frosts, when the change was arrested and the bright colouring gradually receded from the feathers, so that in about six weeks the birds had all resumed their winter plumage.

Several views have been put forward to account for the change of plumage in birds; but when the colouring gradually comes and again recedes from the same feathers, the

* This bird died during its change into summer plumage, in April of the present year; it had already acquired for the second time the characteristics of Russ's Weaver. In *Quelea* this change is effected by a complete moult.

casting of a disguising film will not account for the second operation.

In *Pyromelana* the change of plumage is very slow; the feathers daily gain in intensity, the pale buff of the underparts getting scarcely perceptibly deeper, until at length the velvet-black and fiery orange in *P. franciscana* appear as mere spots or shaft-streaks, which gradually expand fanwise towards the outer fringes of the feathers. This spotting, however, is very uneven, some feathers being developed in advance of others, so as to give the bird a very patchy appearance. In the bright yellow and black plumage of *P. afra* this is even more noticeable.

At the change of plumage the flank-feathers and upper tail-coverts are moulted out, being replaced by long soft feathers, which droop over and almost hide the tail: but none of the feathers of the head, back, breast, and belly are lost; they simply undergo a gradual change of colour.

If it is possible, and we know that it is, for the plumage of birds to be seriously affected after death, there is no reason for asserting that a perfect feather possesses no vitality, and is therefore incapable of change of colour.

Perhaps one of the most marked alterations in coloration after death which I have noticed is that which takes place on the breast of the male Gouldian Finch (*Poephila mirabilis*). In life the breast is vivid ultramarine-blue or very bright pansy-blue; after death the blue gradually fades out of the feathers, leaving them of a dull lilac.

XXVIII.—*On the Nesting of Cassicus persicus, Cassidix oryzivora, Gymnomystax melanicterus, and Todirostrum maculatum.* By Dr. EMIL A. GOELDI, C.M.Z.S., Director of the Museum in Pará.*

I. CASSICUS PERSICUS and CASSIDIX ORYZIVORA.

The nests of most Brazilian birds are by no means easily

* [For a previous article on a similar subject by Dr. Goeldi, see 'Ibis,' 1896, p. 299, and observe that the editorial footnote at the commencement of that article is intended to refer to Koenig-Warthausen in J. f. O. 1868, and not to Dr. Goeldi's excellent notes.—EDD.]